DOCUMENT RESUME

ED 035 063 EA 002 571

AUTHOR	Jarvis, Oscar T.
TITLE	Time Allotments and Pupil Achievement in the Intermediate Elementary Grades. A Texas Gulf Coast Study.
INSTITUTION	Houston Univ., Tex. Bureau of Educational Research and Service.
PUB DATE	Nov 62
NOTE	74p.
AVAILABLE FROM	Bureau of Education Research and Services, University of Houston, 3801 Cullen Blvd., Houston, Texas 77004 ($1.50)
EDRS PRICE	EDRS Price MF-$0.50 HC-$3.80
DESCRIPTORS	*Academic Achievement, Arithmetic, *Intermediate Grades, Language Ability, Mental Tests, Reading Ability, Standardized Tests, *Time Factors (Learning)

ABSTRACT

Designated time allotments for the various course offerings of the elementary schools have evolved with little research showing that present time allotments are the best possible. The problem of this study was to determine the relationship between varying lengths of class periods and pupil achievement in reading, arithmetic, and language. Mental maturity and achievement tests were administered to 713 sixth grade pupils who attended each of the selected schools for all their intermediate elementary grade education. The study shows that maximum class period lengths resulted in greater pupil achievement in every area tested for those with intelligence quotients of 115 or more. For the average student, longer class periods resulted in significantly higher achievement in the areas of arithmetic and language. [Table V may reproduce poorly in hard copy due to small print.] (MF)

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TIME ALLOTMENTS AND PUPIL ACHIEVEMENT IN THE INTERMEDIATE ELEMENTARY GRADES

A Texas Gulf Coast Study

by

Oscar T. Jarvis, Ed. D.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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EA 002 571

Publication of the
Bureau of Education Research and Services
University of Houston
3801 Cullen Boulevard Houston 4, Texas

Price $1.50

November 1962

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PREFACE

One purpose of the Bureau of Education Research and Services is to disseminate the results of research in education. This monograph, being made available to the profession by becoming a part of the series, partially fulfills this purpose. Time allotments for daily schedules in our schools will continue to be a subject of great importance. National and international tensions require that we scrutinize once again the use of time in the instructional program.

While this study is not an all inclusive one, Dr. Oscar T. Jarvis has examined the problem in a well-structured piece of research and contributed results which are worthy of professional consideration. As decisions are being made in connection with longer instructional days, longer school weeks, and lengthened yearly schedules, extensive research in time allotment should be carried on to determine the most effective means of time utilization and whether or not a diminishing return begins to operate.

A special thanks is extended to Mrs. Pauline Oliver, editor, and Mrs. Nona Morriss, typist, for their assistance in preparing the manuscript for publication.

Dr. Richard D. Strahan
Director, Bureau of Education
Research and Services

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INTRODUCTION

Designated time allotments for the various course offerings of the elementary schools have evolved from the opinions of leading educators, societal pressures, and administrative expediency. Little research has been done to prove that present time allotments are the best possible. Otto has observed that "experimental evidence as to how much time per day or week is needed to teach a given subject in accordance with accepted standards is so inadequate that it may be ignored."[1] Smith, Stanley, and Shores have posed two very interesting questions concerning time allotments by asking, "How often should a class meet--five times a week, three times, only once? And how long should the class period be? Should it be thirty minutes, forty minutes, ninety minutes?" They answer these questions by stating, "There is very little research evidence to help answer these questions."[2]

Statement of Problem

Elementary schools vary in prescribed time allotments for the various course offerings of the curriculum. The problem of this study was to determine the relationship between varying class period lengths and pupil achievement in reading, arithmetic, and language of the intermediate elementary school grades in the Texas Gulf Coast area. The basic assumption upon which this research study was made was that maximal and minimal class period length practices have no relationship to pupil achievement in the intermediate elementary school grades.

Purpose of Study

Many factors affect time allotment practices in the intermediate elementary school grades. These factors include the plan of organization for instruction, utilization of special teachers, length of the school day and year, and policies concerning time allotments as adopted by the various school systems. Each one of these factors bears a relationship to time allotment practices as utilized by the elementary schools of the Texas Gulf Coast area. Therefore, it was necessary to establish existing practices regarding time allotments in the Texas Gulf Coast area in order to relate time variables to pupil achievement. These practices were obtained by means of a questionnaire which was mailed to sixty-nine school systems in twenty counties along the Texas Gulf Coast.

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[1] Henry J. Otto, "Time Allotments for the Elementary Schools," Encyclopedia of Educational Research (New York: The Macmillan Company, 1950), p. 379.

[2] B. Othanel Smith, William O. Stanley, and Harlan Shores, Fundamentals of Curriculum Development (New York: World Book Company, 1957), p. 197.

This study was characterized by these objectives inherent in the problem:

1. To determine what the various plans of organization for instruction were as practiced by the Texas Gulf Coast schools.

2. To determine what special teachers were employed in the intermediate elementary grades of the Texas Gulf Coast schools.

3. To ascertain the length of the intermediate elementary school day in the Texas Gulf Coast area.

4. To determine the length of the intermediate elementary school year in the Texas Gulf Coast area.

5. To ascertain what the time allotments for various course offerings were in the intermediate elementary grades of the Texas Gulf Coast schools.

6. To determine the relationship which existed between varying time allotments and pupil achievement in the intermediate elementary school as measured by standardized tests.

7. To analyze the reasons for the observed relations upon pupil achievement as determined by statistical treatment of the data.

8. To draw conclusions and make recommendations for improvement on the basis of the facts derived from the study.

Procedures and Limitations of Study

A systematic approach was utilized in developing this research project. The first procedure was to make a historical summary of the literature concerning time allotment practices in the elementary school. Stipulations were given which indicated why and how this study extended the body of knowledge about the area. The distinctive characteristics of this research project were outlined and compared with previous research in the area in order to point out the significance of this study.

Time allotments for various course offerings in the Texas Gulf Coast school area were determined from information assembled by means of a survey questionnaire mailed to sixty-nine school systems of the Texas Gulf Coast area which had at least 500 pupils in average daily attendance in the school year 1960-61. Sixty-four of the sixty-nine districts responded to the survey questionnaire.

In order to ascertain which schools could be used for gathering pupil data by means of standardized tests it was necessary to establish some basic criteria for selection. This selection was accomplished on the basis of: (1) schools whose time allotments in reading, arithmetic, and language differed significantly; (2) schools which served pupils coming from average socio-economic backgrounds, and (3) schools in which at least four sixth-grade sections were available for testing.

The time allocation practices of the sixty-four responding districts were analyzed to locate the districts which had maximal and minimal class period lengths in reading, arithmetic, and language which differed significantly. Maximal class period lengths for reading were 60-78 minutes daily, for arithmetic 55-60 minutes daily, and for language 40-50 minutes daily. Minimal class period lengths for reading were 40-50 minutes daily, for arithmetic 35-45 minutes daily, and for language 25-30 minutes daily. It was found that seven of these sixty-four districts had time allocations which were compatible with these stipulations. It was also ascertained that the time allocations by actual practice for these seven districts were uniform; therefore, these seven school systems were arbitrarily selected as the schools in which pupil data would be gathered by means of standardized tests.

Mental maturity and achievement tests were administered in April, 1962, to 953 sixth-grade pupils of these seven different school systems. Data for 240 pupils who were not in attendance in each of the selected schools for all of their intermediate elementary grade education, i.e., grades four, five, and six, were not used in the study. This left pupil data for 713 sixth-grade children for analysis.

The differences in pupil achievement in reading, arithmetic, and language were ascertained and measured by differences in scores on standardized achievement tests. Any differences in the mean average pupil achievement scores in various schools were attributed to one of the following factors: (1) differences in time allotted to study of the respective subjects; (2) differences in pupil ability, which were measured by standardized group mental ability tests; (3) differences in other factors, including quality of instruction; or, (4) differences arising from mere chance.

Each one of these four factors has a direct relationship to pupil achievement. In order to relate the time variable to pupil achievement, the possibility of the occurrence of the other three factors had to be eliminated. Differences in pupil abilities were eliminated by relating all achievement scores to mental maturity scores of the pupils. When the mean intelligence quotients of the maximum and minimum time allotment pupils were ascertained, it was found that there was no significant difference in their innate abilities.

The difference arising from quality of instruction and other related factors was randomized out by sufficient samples of both pupil and teachers. Pupil data for 713 children who had been in attendance in the seven schools for all of their instruction in grades four, five, and six were obtained by means of standardized tests. Also, thirty-four sixth-grade sections were tested in the seven school systems. The number of sixth-grade sections tested in each school system ranged from four to eight. Assuming that each sixth-grade section had had a total of three teachers in grades four, five, and six, the children who were tested in each school would have experienced contact with from twelve to twenty-four instructors. Therefore, the pupil data for the 713 subjects of the investigation who had experienced contact with a total of 102 teachers were sufficient samples to randomize out differences arising from quality of instruction.

Differences arising from mere chance or error of measurement were eliminated by gathering sufficient samples to randomize out their probability and by statistically testing the findings of the study in order to establish acceptable levels of confidence. Therefore, the differences, when found, were deemed attributable to time allotment variables.

The test data were then grouped for achievement on the basis of measured intelligence of the pupils for the purpose of determining the relationship between varying time allotments and innate abilities. Pupils with intelligence quotients from 115 up formed one group; children with intelligence quotients from 95 down formed the second group. The differences in pupil achievement in reading, arithmetic, and language from these two groups of pupils were ascertained and measured by standardized test results in relationship to their comparable innate abilities.

REVIEW OF RELATED LITERATURE

A review of the literature was necessary to arrive at some conception of how the time allotments for the various course offerings of the elementary school were formulated. This review delved into the areas of the history and evolution of the elementary curriculum and time allotments for the various course offerings, and covered the current status of time allotments in the elementary curriculum.

Historical Origin of Elementary School Time Allotments

The settlers of the State of Massachusetts were a deeply religious people who believed that everyone should possess the ability to read and comprehend the Bible. Therefore, in 1642 they passed the Massachusetts Law which required that all children be taught to read. Five years later, in 1647, they enacted the first law among English-speaking people to require communities to establish and maintain schools. This was known as the Massachusetts Law of 1647 which ordered that every town which had fifty householders should at once appoint a teacher of reading and writing and provide for his wages in such manner as the town might determine.[3]

Arithmetic was gradually added to the curriculum and by 1775 the schools were teaching what became known as the Three R's: reading, 'riting and 'rithmetic. Many schools were also offering spelling by this date but it was considered to be of minor importance. By 1800 the curriculum of the public schools in some cities of America had been expanded to include grammar.

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[3] Carleton H. Mann, How Schools Use Their Time, Contributions to Education, No. 333 (New York: Bureau of Publications, Teachers College, Columbia University, 1928), p. 13.

Trends in Time Allotment Practices, 1826-1935

Data on time allotment practices in elementary schools of the nineteenth century are scarce, and the changes which occurred did so largely because of societal pressures or administrative expediency. Denny has stated this point as follows:

> During the later decades of the nineteenth century there came a general change in the conception of education. Society began to demand expansion of the curriculum. This expansion raised numerous questions as to the possibility of making room for new subjects by elimination of waste in the traditional courses of study. Educators began to question every topic included in the curriculum.[4]

As a result of societal pressures, administrative expediency, and the emergence of new course offerings, time allotments have changed greatly. Table I presents a general overview of the trends in time allotments which have occurred from 1826 to 1935.

It is evident that special activities and content subjects have increased at the expense of the Three R's. However, it should be pointed out that even in 1935 the Three R's still consumed over fifty per cent of the total instructional time allocations. The content subjects rose from zero per cent in 1826 to 14.5 per cent in 1935. Likewise, the special activities rose from 8.3 per cent to 34.2 per cent in the same period of time.

According to Mann, in 1826, the first year depicted by Table I, the average school day was about six hours in length, exclusive of the lunch period. Within this six-hour day there were morning and afternoon recess periods of fifteen minutes each. In this year, 1826, 91.7 per cent of the six-hour day was devoted to the teaching of the Three R's. As a result,

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[4] Robert Ray Denny, *A Two-Year Study of the Effects of An Increased Time Allotment Upon Achievement In Arithmetic in the Intermediate Grades*, Field Study No. 1 (Greely: Colorado State College, 1955), p. 14.

1,650 of the 1,800 minutes in the school week were allotted to the Three R's with 150 minutes used as recess periods. Research evidence for this period does not give definite time allotments for different subject offerings.[5]

Further details about the trends during this period have been enumerated by Mann. From 1866 to 1926, spelling time allocations were decreased by 45 per cent, and arithmetic by 33 per cent. The time devoted to reading and music remained relatively constant during this period. Reading and arithmetic, in that order, received the greatest time allocations of all the curricular offerings. The greatest increases among the individual courses were made by history and art.[6]

One might erroneously conclude by studying the previous data of Table I that the Three R's received much less attention in 1935 than they did in 1826. Although it is true that during this period the proportion of time allocated to them decreased from 91.7 per cent to 51.3 per cent, Table II shows that the length of the school year increased to the extent that they actually received more time annually. According to Smith, Stanley, and Shores:

> This was due to the tremendous increase in the average number of days of schooling--Nearly four times as many hours were devoted to the Three R's in 1926 as in 1826, and there is no reason to assume that this ratio changed markedly between 1926 and 1935.[7]

From 1826 to 1866 the trend toward a longer school year can be accounted for by the growth of the curriculum and the necessity to find time for the new course offerings. Between the years of 1866 and 1904, the actual time allotment for the Three R's, Content Subjects, and Special

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[5] Mann, op. cit., pp. 14-15.

[6] Ibid., p. 25.

[7] Smith, Stanley, and Shores, op. cit., p. 199.

TABLE I

TIME ALLOTMENT TRENDS IN THE ELEMENTARY SUBJECTS, 1826-1935

Dates	Three R's	Content Subjects	Special Activities
1826	91.7%	0.0%	8.3%
1856	70.1%	15.7	14.2
1866	63.0	12.5	25.5
1904	61.8	12.3	25.9
1926	51.7	11.8	36.5
1935	51.3	14.5	34.2

Figures are per cent of total school time. Three R's consists of reading, 'riting, and 'rithmetic; Content Subjects include history, geography, and science; Special Activities consist of music, drawing, recess, and opening exercises, and other content not readily classified under the Three R's or Content Subjects.

Source: B. Othanel Smith, William O. Stanley, and Harlan Shores, Fundamentals of Curriculum Development (New York: World Book Company, 1957), p. 198.

TABLE II

ANNUAL INCREASE IN THE AVERAGE NUMBER OF DAYS OF SCHOOLING AND ITS EFFECT UPON THE TIME GIVEN TO THE THREE R'S, 1826-1926

Dates	Average Number of days of Schooling	Average No. of Hours Per School Day, Elementary Grades	Total No. of Hours of Elementary Schooling	Per Cent of Time Per Day Given to the Three R's	Average No. of Hours Instruction in the Three R's
1826	163	6.25	1019	91.7	934
1866	523	5.22	2730	62.0	1693
1926	1360	5.07	6895	51.7	3565

Source: B. Othanel Smith, William O. Stanley, and Harlan Shores, Fundamentals of Curriculum Development. (New York: World Book Company, 1957), p. 200.

Activity Subjects[8] changed little, while the length of the school year and average days of school attendance continued to increase.

From 1904 to 1926, there was a period of marked shifts in time allotments for the elementary school course offerings. Concerning this transitory period Smith, Stanley, and Shores have remarked:

> This was the period of two great developments in education: first, the rise of educational science and the resulting crusade against educational inefficiency; second, the rise of the activity movement with its emphasis on developing the entire personality, which called for more than academic content and skills. The first development stressed the importance of accomplishing in less time, by more efficient methods and materials of instruction, desirable results in spelling, arithmetic, reading, and other fields. The second emphasized the importance of the arts and other activities related to the development of wholesome habits and tastes beyond the usual academic areas.[9]

Kyte and Lewis in their study of time allotment practices in 1934-35 found that the proportion of time given to the Three R's was continuing to decrease while proportionately more time was being allotted to the Content and Special Subjects, and new subjects were being added.[10]

These changes in the time allotments resulted in fewer minutes per week being spent on the individual

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[8] Three R's consists of reading, 'riting, 'rithmetic; Content Subjects include history, geography, and science; Special Activity Subjects consist of music, drawing, recess, and opening exercises.

[9] Smith, Stanley, and Shores, op. cit., pp. 200-201.

[10] George C. Kyte and Robert H. Lewis, "Time Tables," Nation's Schools, Volume XVII, (January, 1936), 23-24.

TABLE III

AMOUNTS OF TIME ALLOTTED TO THE ELEMENTARY SUBJECTS AND THEIR COMPARATIVE RANKS FOR THE YEARS 1888, 1904, 1914, AND 1924

Subjects	1888		1904		1914		1924	
	Min.	Rank	Min.	Rank	Min.	Rank	Min.	Rank
Reading	2332	1	2250	1	2032	1	2003	1
Arithmetic	1671	2	1790	2	1521	2	1451	2
Language	1212	3	1488	3	1316	3	1417	3
Physical Training	373	10	353	12	489	11	873	4
Geography	598	8	763	4	735	4	760	5
Recess	800	6	700	5	701	6	752	6
History-Civics	303	11	456	10	558	8	739	7
Drawing	696	7	663	6	609	7	661	8
Spelling	832	5	497	9	704	5	598	9
Music	403	9	536	7	556	9	591	10
Penmanship	902	4	502	8	550	10	567	11
Industrial Arts	0	15	246	15	451	12	410	12
Miscellaneous	300	12	345	14	345	15	381	13
Opening Exercises	24	14	329	13	375	14	377	14
Science	290	13	424	11	406	13	354	15
Total	10736		11341		11348		11934	

Source: Fred C. Ayer, Fundamentals of Instructional Supervision, (New York: Harper Brothers Publishers, 1954), p. 403.

course offering because of improved instruction. Otto has emphasized this point in stating that "Time economies in teaching the Three R's have resulted from improved methods and materials without impairing children's achievement.[11]

Ayer made a study of forty-nine large city elementary schools covering trends in time allotments from 1888 to 1924. In this study, as depicted by Table III, he outlined the mean time spent on the various course offerings and ranked them accordingly from those courses receiving the largest time allocations to those receiving the least. Reading, arithmetic, and language were ranked 1, 2, and 3 for this period of time.

Table III reveals that less time was being expended in 1924 upon the Three R's than there was in 1888 which bears out Otto's contention that time economies have been effected as a result of improved methods and materials.

In 1915, Holmes made a study of fifty metropolitan school systems, grades one through eight, in an attempt to find out how much time was spent annually on the various course offerings of the elementary school. Table IV gives the total time assigned to each subject based upon data assembled in the study.[12]

Table V provides further information on Holmes' 1915 study of time allotment practices in fifty metropolitan school systems.[13] These fifty metropolitan school districts operated school for an average of 38.75 weeks annually. Therefore, by dividing the average grade time of any desired subject by this figure and reducing the quotient to minutes, one can determine the amount of minutes spent per week on that individual course.

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[11] Henry J. Otto, Elementary-School Organization and Administration (New York: Appleton-Century-Crofts, Inc., Third Edition, 1954), p. 311.

[12] Henry W. Holmes, "Time Distributions by Subjects and Grades in Representative Cities," National Society for the Study of Education, 14th Yearbook (Chicago: The University of Chicago Press, 1915), pp. 24 and 26.

[13] Ibid., p. 26.

TABLE IV

AVERAGE ANNUAL TIME DISTRIBUTIONS AND PERCENTAGES BY SUBJECTS IN FIFTY METROPOLITAN SCHOOL SYSTEMS, 1915

Scale	Opening Exercises	Reading	Language	Spelling	Penmanship	Arithmetic	Geography	History	Science	Drawing	Music	Manual Training	Physical Training	Recess	Miscellaneous
Number of cities allotting time in any grade	45	50	50	50	49	50	50	50	47	48	49	46	46	40	28
Average total time* . . .	269	1311	849	454	362	981	474	360	279	410	366	316	343	565	397
Lowest total time allotted in any city	116	675	119	216	244	456	202	140	54	242	135	76	40	240	39
Highest total time allotted in any city	487	2900	1267	774	533	1380	750	700	593	760	600	965	918	933	2018
Average deviation (in hours)*	71	309	163	115	62	175	103	75	106	72	58	132	120	133	237
Percentage of average total recitation time**	0	26.3	13.8	7.4	5.9	15.9	7.7	5.8	4.5	6.7	5.9	5.1	0	0	0

*Only cities allotting time considered

**Reckoned on the sum of the averages for the indicated subjects

Source: Henry W. Holmes, "Time Distributions by Subjects and Grades in Representative Cities," National Society for the Study of Education, 14th Yearbook (Chicago: The University of Chicago Press, 1915), p. 25.

TABLE V

MEAN ALLOCATIONS BY SUBJECT AND GRADE IN FIFTY METROPOLITAN SCHOOL SYSTEMS, 1915

Grade		Subject														
		Opening Exercises	Reading	Language	Spelling	Penmanship	Arithmetic	Geography	History	Science	Drawing	Music	Manual Training	Physical Training	Recess	Miscellaneous
I	Cities allotting	43	50	47	35	47	38	6	13	37	49	49	19	43	37	18
	Average allotment*	38	266	75	54	50	60	16	27	37	98	45	42	46	87	76
	Percentage average total recitations†	...	30.6	8.6	6.3	6.7	6.9	1.8	3.1	4.3	11.3	5.2	4.8	...	...	..
	Lowest–highest*	15 - 83	100 - 570	20 - 200	16 - 180	30 - 67	16 - 180	6 - 30	9 - 50	13 - 140	20 - 95	15 - 67	15 - 100	6 - 117	33 - 120	15 - 233
II	Cities allotting	43	50	40	49	49	50	41	15	37	49	49	19	43	40	22
	Average allotment*	38	235	79	66	60	96	7	31	41	54	84	47	41	83	63
	Percentage average total recitations†	...	26.1	8.7	7.3	6.7	10.7	0.8	3.4	4.5	6	0.3	5.1	...	...	...
	Lowest–highest*	16 - 100	120 - 374	33 - 200	30 - 180	30 - 100	33 - 190	6 - 33	7 - 50	7 - 116	20 - 79	9 - 55	15 - 100	6 - 117	33 - 133	17 - 277
III	Cities allotting	43	50	50	50	49	50	36	22	39	49	49	23	43	40	21
	Average allotment*	38	188	94	73	52	131	50	35	40	56	47	40	40	83	87
	Percentage average total recitations†	...	20.8	10.3	8	5.7	14.4	5.4	3.8	4.4	6.2	5.1	4.5	...	...	...
	Lowest–highest*	17 - 60	83 - 283	33 - 188	31 - 165	22 - 100	46 - 200	10 - 117	20 - 63	9 - 100	21 - 95	15 - 75	10 - 100	7 - 133	48 - 133	19 - 383
IV	Cities allotting	43	50	50	50	49	50	49	35	44	49	49	26	42	41	24
	Average allotment*	35	153	106	67	53	149	83	57	37	53	48	45	40	77	77
	Percentage average total recitations†	...	15.8	10.9	6.9	5.5	15.4	8.5	5.8	3.8	5.5	4.9	46	...	...	..
	Lowest–highest*	16 - 83	77 - 253	40 - 178	33 - 120	27 - 80	67 - 620	25 - 200	15 - 87	6 - 80	27 - 95	13 - 75	10 - 133	7 - 117	25 - 130	3 - 357
V	Cities allotting	43	50	50	50	49	50	50	42	45	49	50	32	43	4	23
	Average allotment*	32	126	116	61	50	144	102	67	34	50	45	50	38	73	79
	Percentage average total recitations†	...	13.1	12	6.3	5.1	14.9	11.2	6.9	3.5	5.2	4.7	5.2	...	...	..
	Lowest–highest*	16 - 50	33 - 210	40 - 320	30 - 116	22 - 80	48 - 200	50 - 167	15 - 158	13 - 80	16 - 95	13 - 67	24 - 133	7 - 117	25 - 108	3 - 357
VI	Cities allotting	43	50	50	50	48	50	50	42	43	49	50	37	43	40	23
	Average allotment*	31	117	118	58	47	146	107	71	40	50	45	57	40	70	78
	Percentage average total recitations†	...	12.1	12.2	5.9	4.8	15	11	7.3	4.2	5.1	4.6	5.8	...	...	...
	Lowest–highest*	12 - 50	33 - 167	40 - 180	26 - 117	18 - 80	67 - 200	37 - 180	20 - 133	13 - 80	13 - 95	18 - 67	18 - 160	6 - 133	32 - 108	3 - 357
VII	Cities allotting	42	50	50	47	44	50	50	49	30	49	50	44	44	37	26
	Average allotment*	31	98	134	52	39	140	98	91	45	50	45	72	38	66	78
	Percentage average total recitations†	...	10	13.7	5.3	3.9	14.4	9.9	9.2	4.5	5	4.4	7.1	...	...	..
	Lowest–highest*	12 - 54	33 - 200	54 - 200	16 - 100	18 - 67	74 - 200	37 - 158	33 - 167	12 - 133	16 - 95	13 - 67	18 - 233	6 - 133	31 - 108	7 - 320
VIII	Cities allotting	43	50	50	47	43	50	34	50	44	49	49	44	43	37	22
	Average allotment*	31	97	142	51	37	142	76	117	57	49	44	74	39	66	87
	Percentage average total recitations†	...	9.6	14.1	5.1	3.7	14.1	7.6	11.6	5.7	4.9	4.4	7.4	...	...	..
	Lowest–highest*	12 - 50	33 - 200	65 - 200	16 - 100	18 - 67	62 - 210	37 - 133	37 - 216	13 - 133	10 - 74	13 - 67	18 - 253	6 - 133	31 - 106	10 - 370

* Only cities giving allotments considered.

† Reckoned on the sum of the average allotments in recitation subjects in the given grade, only cities giving allotments considered.

Source: Henry W. Holmes, "Time Distributions by Subjects and Grades in Representative Cities," National Society for the Study of Education, 14th Yearbook, (Chicago: The University of Chicago Press, 1915), p. 26b.

In 1915, seventy per cent of the time allotments were utilized by reading, language, arithmetic, spelling, and penmanship. These subjects, with history and geography, accounted for 82 per cent of the "recitation" time. The remaining 18 per cent of the time was given to the four other "recitation" subjects, science, drawing, music, and opening exercises.

Recent Trends in Time Allotment Practices

In 1944, Reinoehl made a study of time allotments in the elementary schools and found that the schools were decreasing the amount of time allotted to the fundamentals and increasing the time allocations for special and content subjects. This study marked the beginning of a tendency by schools to fuse related subjects into one. As an example of the fused elementary curriculum, one might find the grouping of reading, language, spelling, and penmanship into what was called the "language arts" program and history, geography, and civics into the "social studies" program.[14]

Dyer, in 1947, was advocating a flexible schedule of time allotments for the various course offerings of the elementary curriculum. This flexible schedule had provision for long blocks of time. He advanced the theory that time allocations should be disregarded when children were engaged in subject matter or activities that held their interest.[15]

Lee observed that by 1949 it was fully recognized that flexible time schedules were rapidly replacing the traditional compulsory time allotment schedules. The tendency to fuse related subjects required longer blocks of time, as was previously noted by Reinoehl's study in 1944.[16]

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[14] C. M. Reinoehl, "Time Allotment of School Subjects and Length of School Day," _National Elementary Principal_, XXIII (June, 1944), 15-18.

[15] L. E. Dyer, "Improving the Organization for Learning Within the Classroom," _National Elementary Principal_, XXVI (February, 1947), 8-9.

Current Status of Time Allotment Practices

It appears from a review of the literature, therefore, that the existing time allotments of the elementary school are based largely on opinion and not on research. One that is available, for the most part, is a collection of opinions of leading educators and existing practices of leading schools. Time allotments which have occurred are a result of administrative expediency in submission to societal pressures. This point has been expressed by Bathurst as cited by Otto:

> School systems are permitting individual schools greater freedom in the use of school time. In the 100 cities of 43 states visited by a team from the U.S. Office of Education in 1947-48, only 35 school systems were requiring individual schools to adhere rigidly to time allotments recommended by the central office.[17]

In 1960, the United States Office of Education completed a research study to determine the current instructional time allocations in public elementary schools for grades 1-6 of urban places. Table VI presents the findings of this study.

The most common policy was that of "suggested time per subject," with slightly less than half the urban places employing that procedure. The designated

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[16] Beatrice Crump Lee, "Instructional Time Allotment in Elementary Schools," National Education Association Research Memo, 1961--29 (July, 1961), p. 2.

[17] Henry J. Otto, Elementary-School Organization and Administration (New York: Appleton-Century-Crofts, Inc., 1954), pp. 311-312.

TABLE VI

TIME ALLOCATION POLICY IN PUBLIC ELEMENTARY SCHOOL GRADES IN URBAN PLACES, 1960

Policy	United States	
	Per cent	Schools
Suggested time per subject	46.1	1986
No recommended time per subject	12.4	533
Prescribed time per subject	10.7	463
Block time per subject	9.9	427
Combinations	9.0	389
Other	1.5	61
No Answer	10.4	448
Total	100.0	4307

Source: Stuart E. Dean, "Instructional Time Allocation," Elementary School Administration and Organization (Washington: U.S. Office of Education, 1960), p. 52.

policies of "no recommended time," "prescribed time," and "block time" were about evenly distributed, each approximately 10 per cent of national practice. Dean has summarized the practices thusly, "The most prevalent practice, then, takes the form of a suggested time allotment guideline for teachers which, presumably, is permissive and non-restrictive."[18]

The United States Office of Education also questioned the same 4,507 schools to determine the length of the school day by actual practice. These findings in Table VII reveal that the average school day provides for five and one-half hours of instruction for both the primary and intermediate grades.

This 1960 study by the U.S. Office of Education also delved into the length of the school year, the results of which are shown in Table VIII. The school year of 180 days is currently the most common in the United States.

The curriculum of the elementary school has evolved into a pattern of six broad subject fields: language arts social studies, mathematics, art, music, and physical education. Table IX presents the proportionate time allocations given over to these subject fields as practiced by the Denver Public schools as late as 1958. It is evident that lanauage arts, social studies, and mathematics consume from 75 to 80 per cent of the instructional day in the Denver Public Schools.

In 1958, the San Diego Public Schools made a study of the time allotment practices of the seventeen largest California metropolitan school systems in an attempt to determine time allocations by subjects and grades for the State. The findings of that study are presented in Table X, as cited by Lee. California state law requires only that physical education, exclusive of recess and lunch time, must total at least 100 minutes a week (20 minutes a day) and that at least 50 per cent of the school week must be devoted to the basic skill subjects.

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[18] Stuart E. Dean, "Instructional Time Allocation," Elementary School Administration and Organization (Washington: U.S. Office of Education, 1960), p. 52.

TABLE VII

NUMBER OF HOURS OF THE ELEMENTARY SCHOOL DAY IN URBAN PLACES, 1960

Hours	Grades 1-3		Grades 4-6	
	Per cent	Schools	Per cent	Schools
4-4½	12.0	517	.8	33
5	29.5	1273	14.0	603
5½	40.9	1759	45.4	1956
6	14.5	626	36.5	1571
Other	2.6	111	2.2	94
No Answer	.5	21	1.1	50
Total	100.0	4307	100.0	4307

Source: Stuart E. Dean, "Instructional Time Allocation," Elementary School Administration and Organization (Washington: U.S. Office of Education, 1960), pp. 34-36.

TABLE VIII

NUMBER OF DAYS IN THE ELEMENTARY SCHOOL YEAR IN URBAN PLACES, 1960

Number of Days Annual Instruction	Grades 1-6	
	Per cent	Schools
163-170	1.0	44
171-174	6.8	291
175-179	33.7	1451
180	34.9	1502
181-185	11.4	492
186-190	2.8	120
191-196	1.0	41
No Answer	8.4	366
Total	100.0	4307

Source: Stuart E. Dean, "Instructional Time Allocation," *Elementary School Administration and Organization* (Washington: U.S. Office of Education 1960), pp. 34-39.

TABLE IX

THE ELEMENTARY SCHOOL CURRICULUM AND RECOMMENDED PROPORTIONAL TIME ALLOTMENTS IN THE DENVER PUBLIC SCHOOLS

Subject Area	Primary Grades	Intermediate Grades
Language Arts	50-55%	30-40%
Social Studies	10-15	15-20
Mathematics	10-15	15-20
Art	8-10	8-10
Music	5-08	8-10
Physical Education	5-08	8-10

Source: Marie A. Mehl, Hubert H. Mills, and Harl R. Douglass, *Teaching in Elementary School* (New York: The Ronald Press Co., 1958), pp. 203-206.

TABLE X

WEEKLY TIME ALLOTMENTS IN ELEMENTARY SCHOOLS BY SUBJECT AND GRADE LEVEL IN THE SEVENTEEN LARGEST CALIFORNIA METROPOLITAN SCHOOL DISTRICTS, 1958

Subjects	Grades 1	2	3	4	5	6
Reading and Literature	350	322	300	300	300	299
Language	100	100	100	140	150	140
Spelling	50	75	100	100	100	100
Writing	50	50	75	75	75	75
Arithmetic	100	100	200	225	225	225
Social Studies	225	220	233	300	300	300
Art Activities	100	100	100	100	100	100
Music	100	100	100	100	100	100
Physical Education	100	100	100	100	100	100
Recess	100	100	100	100	100	100

Source: Beatrice Crump Lee, "Instructional Time Allotment in Elementary Schools," National Education Association Research Memo No. 1961-29 (July, 1961), p. 4.

The state board of education also requires that there be at least 20 minutes of recess time each day.[19]

In 1956 the Indiana State Department of Public Instruction reported a study of time allotment in the elementary grades of the public schools of Goshen, Indiana. From the figures outlined in Table XI it can be seen that in grades four, five, and six approximately forty-five per cent of the school day is given over to the language arts program. It was surprising to note the absence of allocations for science in grades five and six.[20]

Lee also cited a booklet published by the public schools of Tulsa, Oklahoma, in 1961 which was designed to inform parents about the educational program provided for their children. The booklet included time allotment schedules presented in Table XII. According to the table, time allocations were uniform for grades one through six in the Tulsa Public Schools.

Table XIII outlines the time allotment practices of the Houston Public Schools. This school system has a suggested time for each subject included in the elementary curriculum, and language arts received here the largest time allotment cited in the United States.

Studies of Relationships of Varving Time Allotments and Pupil Achievement

Research concerning time allotments is scant because of a multiplicity of variables. Daugherty has stated well some of these variables in observing that:

> So many obstacles stand in the way of scientific investigations of time allotments such as pupil variations in needs and abilities; context of the courses; differences in methods of teaching; size

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[19] Lee, op. cit., p. 4.

[20] Ibid., p. 4.

TABLE XI

PERCENTAGE TIME ALLOCATIONS BY SUBJECT IN THE GOSHEN, INDIANA, PUBLIC SCHOOLS, 1956

Subjects	Grades					
	1	2	3	4	5	6
Language Arts	62.7%	63.1%	56.2%	46.5%	43.0%	42.5%
Reading	51.0	44.0	31.8	22.8	16.7	15.9
English	-0-	3.3	9.6	10.5	15.7	15.5
Handwriting	7.0	7.5	5.8	3.7	3.8	4.1
Spelling	4.7	3.8	9.0	9.5	6.8	7.0
Arithmetic	11.2	13.0	12.8	17.3	17.3	16.2
Social Studies	3.1	3.0	4.7	12.6	16.0	15.4
Science	3.1	3.9	2.1	2.3	-0-	-0-
Health Education	3.4	3.0	6.2	5.4	9.6	11.5
Fine Arts	13.6	11.0	10.2	9.2	8.5	8.5
Miscellaneous	2.9	3.0	7.8	6.7	5.6	5.9

Source: Beatrice Crump Lee, "Instructional Time Allotment in Elementary Schools," _National_ _Education_ _Association_ _Research_ _Memo_ No. 1961-29 (July, 1961), p. 4.

TABLE XII

WEEKLY TIME ALLOTMENTS BY SUBJECT AND GRADE IN THE TULSA ELEMENTARY PUBLIC SCHOOLS, 1961

Subjects	Grades					
	1	2	3	4	5	6
Reading-Social Studies	570	390	390	360	335	335
Language	75	75	75	90	90	90
Spelling	0	75	75	75	75	75
Handwriting	80	80	80	75	50	50
Arithmetic	75	130	130	150	200	200
Health	0	50	50	50	50	50
Art	140	140	100	100	100	100
Library	175	175	200	200	200	200
Music	85	85	100	100	100	100
Physical Education	175	175	200	200	200	200
Science-Geography	140	140	100	100	100	100
Speech	85	85	100	100	100	100
Total	1600	1600	1600	1600	1600	1600

Source: Beatrice Crump Lee, "Instructional Time Allotment in Elementary Schools," National Education Association Research Memo No. 1961-29 (July, 1961), p. 5.

TABLE XIII

TIME ALLOCATIONS BY SUBJECT AND GRADE IN THE HOUSTON PUBLIC SCHOOLS, 1961

Subject	1	2	3	4	5	6
Language Arts	160-180 a day	160-180 a day	130-150 a day	130-150 a day	130-150 a day	130-150 a day
Mathematics	20-30 a day	20-30 a day	50-60 a day	50-60 a day	50-60 a day	50-60 a day
History and Geography	-0-	-0-	50-60 a day	50-60 a day	50-60 a day	50-60 a day
Science	50-70 a day	50-70 a day	20 a day	20 a day	20 a day	20 a day
Health and Physical Education	150 a week	150 a week	150 a week	150 a week	150 a week	150 a week
Foreign Language	-0-	-0-	60 a week	60 a week	60 a week	60 a week
Length of School Day (Including Lunch Time)	5 hours	5 hours	6 hours 10 min.	6 hours 10 min.	6 hours 10 min.	6 hours 50 min.

Source: Beatrice Crump Lee, "Instructional Time Allotment in Elementary Schools," National Education Association Research Memo No. 1961-29 (July, 1961), p. 5.

> of the classes; overcrowding of classrooms; shortages of teachers; and constantly changing theories of what is good education.[21]

Otto has further emphasized this point by stating:

> The amount and proportion of time to be allocated to each subject or activity is difficult to determine. There are several reasons why decisions on time allotments cannot be made on a scientific basis or prescribed for all schools in the nation. Except for limited research in such narrow areas as spelling and handwriting, there is no scientific evidence on how much school time in which grades is required to achieve what levels of performance. Society's changing demands upon elementary schools, changing conceptions of desired levels of pupil achievement, and improved methods and materials are causing time allotments practices to remain in flux.
>
> No nation-wide survey of time allotments in elementary schools has been made since Mann's study in 1926. The trend toward broad fields and activity-type curriculum and the unit organization of teaching-learning situations would probably make it impossible to repeat a nation-wide survey with the methods used by Mann. New studies in this field would probably have to be made by carefully structured interview and questionnaire procedures geared to school curricula as they are evolving in each state or in school systems moving in similar directions in curriculum revision. The difficulty of making such studies probably explains why none has been made in recent years.[22]

As new subjects have come into existence, they have competed with established courses offerings for a place in the curriculum schedule. Generally speaking, the length of the school day has not been extended; and as the new course offerings have been included in the schedule, revision of existing time allotments have been necessary for their inclusion. It is not unusual to find that the amount of time given to the various subjects increases or decreases as the social realities change the goals of the people.[23]

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[21] James L. Daugherty, A Study of Achievement in Sixth Grade Arithmetic in Des Moines Public Schools, Research Study No. 1. (Unpublished doctoral dissertation, Colorado State College, Greely, 1955), p. 13.

[22] Henry J. Otto, Elementary School Organization and Administration (New York: Appleton-Century-Crofts, Inc., 1954), p. 311.

Only a few scientific research endeavors have been conducted to ascertain what relationships exist between varying time allotments and pupil achievement in the intermediate elementary grades. A survey of the Encyclopedia of Educational Research, Education Index, and Thesis Abstracts produced only four such studies.

The first of these studies was completed by Daugherty in 1955. His study was made in an attempt to compare achievement made by sixth-grade pupils in the Des Moines Public Schools using a fifty-minute daily arithmetic period. The students participating in the fifty-minute period were members of the experimental group, and those assigned to the forty-minute period were members of the control group. There were seven experimental and seven control groups set up with 312 students in each. Daugherty tested both groups with a pre-test in October of 1953 and re-tested them in April of 1954. He found that the mean gain of the experimental group in this period of time was 1.3 years and that the mean gain of the control group was .9 of a year. This gave the experimental group of a mean gain of .4 of a year over the control group.[24]

In 1955 Denny attempted to determine what effect, if any, the increased time allotment, per se, would have upon pupil achievement made by fifth-grade pupils using a fifty-minute daily arithmetic period as compared with that of pupils using a forty-minute period daily in the Des Moines Public Schools. His study involved a pre-test and a re-test of 263 students in each of the experimental and control groups. He found that the mean gain of the experimental group over that of the control group was only .1 of a year. This gain covered the period from the pre-test in October, 1953, to the re-test in April, 1954.[25]

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[23] Smith, Stanley, Shores, op. cit., p. 197.

[24] Daugherty, op. cit., pp. 1-vi.

In 1958 Mowrer investigated the effect that the length of the high school class period in English has on achievement in English. He made an analysis of two groups of girls and boys. Grouping was made on the basis of the length of the high school class period for English I, II, and III during which the boys and girls studied. A group of boys and girls were designated as belonging to the long period group who study English for at least fifty minutes daily. Boys and girls who studied high school English in periods of less than fifty minutes in length were designated as the short period group. He found that there was no significant difference in pupil achievement resulting from time variables as determined by the administering and evaluation of standardized tests.[26]

Phillips, in 1961, concluded a study of the relationship of increasing the length of the school day for 2,527 third-grade students by one hour. In 1960 he tested 2,300 similar third-grade students in the sixth month of school. In 1961 he tested the 2,527 third grade students in the seventh month of school after they had experienced one hour additional education daily. The results of his investigation are presented in Table XIV. Although the 1961 students had an additional month of schooling before the achievement test battery, the over-all difference in pupil achievement was highly significant.

Summary

It may be said with authority that there is scant evidence that existing time allocations were based on research findings. Little experimental research has been made to determine the extent of the effect of varying time allotments upon pupil achievement, and that which has been done is too meager and inconclusive to warrant any real consideration. The changes in time allotments which have occurred in the elementary program appear to be a product of administrative expediency, societal pressure, and opinions of leading educators.

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[25] Denny, op. cit., pp. 80-81.

[26] George E. Mowrere, A Study of the Effect of the Length of the High School English Class Period on Achievement in English, Abstracts of Dissertations in Education, 1955-1957 (University of Missouri, Columbia, 1956), pp. 62-63.

TABLE XIV

EFFECTS ON PUPIL ACHIEVEMENT OF LENGTHENED SCHOOL DAY OF ONE HOUR FOR 2,527 THIRD-GRADE STUDENTS IN BREVARD COUNTY SCHOOLS OF FLORIDA, 1960-1961

1960 Medians	Months Above or Below Expected	Area Tested	1961 Medians	Months Above or Below Expected	Median Gain
103.1	+3	I. Q.	103.5	+3	.4
3.7	+1	Reading	3.9	+2	.2
3.5	-1	Arithmetic	3.8	+1	.3
3.4	-2	Language	4.2	+5	.8
3.6	0	Spelling	3.9	+2	.3

Source: Herbert E. Phillips, "We Lengthened the School Day," *Phi Delta Kappan*, XLIII (January, 1962), p. 169.

ANALYSIS OF TIME ALLOTMENTS IN ELEMENTARY SCHOOLS

In an attempt to determine what the existing time allotment practices were in the intermediate grades of the Texas Gulf Coast elementary schools, a survey of sixty-nine representative districts in twenty counties was made by questionnaire in February and March, 1962.

Sixty-four of the sixty-nine districts responded to questions covering six areas which were pertinent to time allotments in elementary schools. The six areas were organization for instruction, policy regulating curricular time allotments, uniformity of time allotments by actual practice, length of the elementary school day, length of the elementary school year, and weekly minutes devoted to the various courses of the elementary curriculum.

Organization for Instruction

Table XV points out that the major organizational plan for instruction in grades four, five, and six in the Texas Gulf Coast area is the self-contained classroom with special teachers. Sixty-six per cent of the districts responding utilized this organizational method in the intermediate grades. The partially self-contained classroom was utilized most frequently in grade four, less frequently in grade five, and least frequently in grade six. Conversely, Table XV shows that the departmental method of organization was utilized most in grade six. Seventeen per cent of the districts had departmentalization in the intermediate grades. Only twelve per cent of the districts utilized the completely self-contained classroom organization, and five per cent used the combination plan such as the Platoon system or Winnetka Plans.

TABLE XV

PLAN OF ORGANIZATION FOR INSTRUCTION IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Grade	Completely Self-Contained	Self-Contained With Special Teachers	Departmentalized	Combination (Platoon Systems, etc.)	Total Schools
Fourth	13	47	2	2	64
Fifth	7	45	9	3	64
Sixth	3	34	22	5	64
Total	23	126	33	10	192
Mean	7.8	42.0	11.0	3.2	64
Per Cent	12	66	17	5	100

TABLE XVI

SPECIAL TEACHERS IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS WITH PARTIALLY SELF-CONTAINED CLASSROOMS (1962)

Grade	Music	P.E.	Art	Spanish	Reading	Mathematics	Speech	English	Science
Fourth	39	18	12	7	5	3	2	1	1
Fifth	39	19	14	6	5	4	2	1	1
Sixth	32	14	11	6	3	3	2	2	2
Total	110	51	37	19	13	10	6	4	4
Mean	36.7	17.0	12.3	6.3	4.3	3.3	2.0	1.3	1.3
Per Cent	44	20	14	7	5	4	2	2	2

Since the major organizational plan of instruction in the Texas Gulf Coast area was found to be the self-contained classroom with special teachers, Table XVI was constructed to depict the nature and frequency of assignment of these teachers by the various districts. The most commonly utilized special teacher in the intermediate grades was the music teacher. An average of forty-four per cent of the districts employed special music teachers for grades four, five, and six. Twenty per cent of the responding districts indicated that they employed special teachers for physical education; fourteen per cent of the schools replied that they had special art teachers; seven per cent of the districts responded that they had special teachers for Spanish. Other special teachers utilized in the order of their prevalence were reading, math, speech, and science, each being used in five per cent or less of the districts.

Time Allotment Policies

Only twenty-one per cent of the districts responding to the questionnaire had prescribed time allocations for each subject, as may be seen in Table XVII. This most frequently occurred in grade six where the schools were departmentalized for instructional purposes. This table also points out that forty-four per cent of the school systems utilized approximate time allocations for each subject. By definition, approximate prescribed times per subject were allocations as set by supervisory or administrative policy with leeway provisions for the teacher to deviate slightly from these set time intervals as justifiable needs arose. Twenty-four per cent of the districts utilized suggested time allocations per subject. In these districts the school simply suggested certain time allocations, but the teachers were free to accept them as their own or adopt whatever allocations they deemed wise. Seven per cent of the districts utilized block time per subject. This practice most frequently occurred in systems which were using the Platoon System or broad fields approach to the curriculum. Only five per cent of the districts responding indicated that they did not have any recommended time per subject as set by school policy.

Uniformity of Time Allotment Practices

The districts were asked to respond as to whether or not by actual practice their teachers followed time allocation policies in their schools as set by the administrative or supervisory personnel. Table XVIII indicates that eleven per cent of the districts were following the stipulated time allocations identically and forty-six per cent of the districts responded that their teachers were adhering uniformly to time allocations of their systems. However, the other forty-three per cent of the districts indicated that by actual practice their time allocations were not uniform.

Length of Elementary School Day and Year

Forty-nine per cent of the districts were found to have school days which ranged in length from seven hours to seven hours and fourteen minutes, as indicated on Table XIX.

Only five per cent of the districts had school days which were as long as seven and one-half hours daily. Fourteen per cent of the districts had the minimum school days which were from six and one-half hours to six hours and forty-four minutes.

The length of the elementary school year in Texas Gulf Coast schools was predominately 175 days. Table XX indicates that this was the practice in seventy-three per cent of the districts. Ten districts had annual school years with 176 days of instruction, three had 177 days, one had 178 days, and two had 180 days. Many of the districts responding, however, indicated that they would have had school years with 180 days of annual instruction had it not been for Hurricane Carla, which disrupted schools for several days during the first month of the 1961-62 school year along the Texas Gulf Coast.

TABLE XVII

SCHOOL POLICIES REGULATING TIME ALLOTMENTS IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Grade	Prescribed Time Per Subject	Approximate Time Per Subject	Suggested Time Per Subject	Block Time Per Subject	No Recommended Time Per Subject	Total Schools
Fourth	9	30	18	4	3	64
Fifth	12	30	15	4	3	64
Sixth	19	24	13	5	3	64
Total	40	84	46	13	9	192
Mean	13.3	28.0	15.3	4.4	3.0	64
Per Cent	21	44	24	7	5	100

TABLE XVIII

UNIFORMITY OF TIME ALLOTMENTS IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Grade	Identical	Uniform	Varied	More Varied	Total Schools
Fourth	6	30	26	3	65
Fifth	7	30	26	2	65
Sixth	8	29	26	2	65
Total	21	89	78	7	195
Mean	7.0	29.7	26.0	2.3	65
Per cent	11	46	40	3	100

Minutes Devoted Weekly to Various Course Offerings

The sixty-nine districts surveyed were asked to report the weekly minutes which they gave to the various course offerings of the curriculum for grades four, five, and six. The subject and special activities areas covered in their reports were arithmetic, science, reading, English, handwriting, spelling, social studies, physical education, music, health, art, Spanish, opening exercises, lunch, and recess.

Table XXI shows that thirty-three per cent of the fifty-five reporting districts gave from 220-239 minutes weekly to instruction in arithmetic. By converting these weekly allocations into daily minutes, it was concluded that 45-minute periods for instruction in arithmetic were most commonly utilized by the districts reporting. It was also found that the smallest weekly allocations for arithmetic were 140-159 minutes, and the largest weekly allocations were 360-379 minutes. Thus it was evident that there was much diversity of practice concerning time allotments for arithmetic in grades four, five, and six in schools of the Texas Gulf Coast area.

There was no apparent agreement among the districts surveyed concerning the time allocations for science, as shown in Table XXI. Although twenty-eight per cent of them had weekly allocations of 140-159 minutes, the allotments of the other seventy-two per cent of the districts varied considerably. One system had allocations as small as 60-79 minutes weekly for instruction in science; in sharp contrast to this minimum practice, another district allocated 300-319 minutes of weekly instruction. Since the most commonly utilized weekly minutes for the teaching of science ranged from 140-159 minutes, as practiced by twenty-eight per cent of the districts, it was interesting to note that forty-six per cent of the schools had time allotments in excess of this practice. It would appear that perhaps time allocations for the teaching of science are on the increase in the schools of the Texas Gulf Coast area.

Time allocations for the teaching of social studies varied sharply also in the Texas Gulf Coast area, as seen in Table XXI. One district allocated as

TABLE XIX

LENGTH OF SCHOOL DAY IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOLS (1962)

Length of School Day in Hours	Grade			Total	Mean	Per Cent
	Fourth	Fifth	Sixth			
7:30-7:44	2	3	4	9	3.0	5
7:15-7:29	8	8	8	24	8.0	14
7:00-7:14	26	29	29	84	28.0	49
6:45-6:59	11	10	10	31	10.3	18
6:30-6:44	10	7	6	23	7.7	14
Total	57	57	57	171	57.0	100

TABLE XX

LENGTH OF THE SCHOOL YEAR IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Annual Teaching Days	Number of Schools	Per Cent
180	2	3
179	0	0
178	1	2
177	3	5
176	10	17
175	43	73

TABLE XXI

TIME ALLOCATIONS IN ARITHMETIC, SCIENCE, AND SOCIAL STUDIES IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Time Allotment In Minutes Per Week	Arithmetic					Science					Social Studies				
	Grade 4	Grade 5	Grade 6	Total	Per cent	Grade 4	Grade 5	Grade 6	Total	Per cent	Grade 4	Grade 5	Grade 6	Total	Per cent
440-459												1		1	1
420-439															
400-419											1			1	1
380-399															
360-379		1	1	2	1							1		1	1
340-359			1	1	1							3	3	6	4
320-339		1		1	1										
300-319	6	9	6	21	13			1	1	1	5	4	4	13	8
280-289	1	1	2	4	2			1	1	1					
260-279	5	7	10	22	13	1	1	1	3	2	3	4	7	14	8
240-259	10	7	7	24	15	1	2	4	7	4	2	4	5	11	7
220-239	19	18	18	55	33	6	7	8	21	13	15	14	15	44	26
200-219	8	7	8	23	14	4	6	7	17	10	15	15	12	42	25
180-199	1	1		2	1	2	2	2	6	4	1	2	1	4	2
160-179	3	2	2	7	4	9	5	4	18	11	4	3	3	10	6
140-159	1	1	1	3	2	16	17	13	46	28	6	3	4	13	8
120-139						4	4	5	13	8	1		1	2	1
100-119						6	7	7	20	12	1	1	1	3	2
80- 99						4	3	2	9	5					
60- 79							1	1	2	1					
Total	54	55	56	165	100	53	55	56	164	100	55	55	56	165	100

little as 100-119 minutes of weekly instruction for social studies in grade five, while another district allocated as much as 440-459 minutes. The most common practice among the districts reporting was 220-239 minutes of weekly instruction in social studies, or daily class periods of 45 minutes, as practiced by twenty-six per cent of the districts. Twenty-five per cent of the districts allocated 200-219 minutes weekly for the teaching of social studies.

Since reading was the first dominant subject in the elementary school curriculum historically, and has always ranked that way down through the evolution of the English Grammar School, it was interesting to note from a study of Table XXII the conflicting philosophies concerning time allocations for this subject as practiced by school systems of the Texas Gulf Coast area. Although twenty-four per cent of the districts allocated 300-219 minutes weekly to instruction in reading, which would be about 60 minutes daily, this was by no means a commonly accepted practice. Twenty per cent of the districts allocated 220-239 minutes weekly for the teaching of reading, which provided for daily class periods of about 45 minutes. The smallest allocations occurred in the sixth grade where one district gave slightly more than 100 minutes weekly. One system had provision for 440-459 minutes of weekly instruction in reading which was the largest allocation. Table XXII reveals that seventy-one per cent of the districts have time allocations for the teaching of reading which range from 220 to 319 minutes weekly, or 45 to 60 minutes daily.

Thirty-two per cent of the districts surveyed had time allocations of 200-219 minutes of weekly instruction for English, or 40 minutes daily class periods, as shown in Table XXII. Twenty-eight per cent of the districts had time allocations of 220-239 minutes weekly. Thus, sixty per cent of the districts surveyed had time allocations for the teaching of English which ranged from 200-239 minutes weekly, or about 45 minutes daily. The over-all range of allocations, as depicted by Table XXII, for the teaching of English in grades four, five, and six was from 100-119 minutes weekly in one district to 300-319 minutes weekly in another.

Table XXII points out that thirty-two per cent of the systems surveyed had weekly time allocations for the

TABLE XXII

TIME ALLOCATIONS IN READING, ENGLISH, HANDWRITING, AND SPELLING IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Time Allotment In Minutes Per Week	Reading					English					Handwriting					Spelling				
	Grade					Grade					Grade					Grade				
	4	5	6	Total	Per cent	4	5	6	Total	Per cent	4	5	6	Total	Per cent	4	5	6	Total	Per cent
440-459	1	1	1	3	2															
420-439	1			1	1															
400-419	1			1	1															
380-399																				
360-379	2	1	2	5	3															
340-359	2	2	1	5	3															
320-339	2	1		3	2															
300-319	17	11	8	36	24			2	2	1										
280-299	4	1	1	6	4	1		2	3	2										
260-279	3	6	3	12	8		1	2	3	2										
240-259	5	9	9	23	15	2	6	3	11	8										
220-239	6	12	13	31	20	14	13	13	40	28								1	1	1
200-219	4	6	8	18	12	16	18	12	46	32						1	1	2	4	3
180-199	1		2	3	2	2	1	2	5	4			1	1	1	1	1	1	3	2
160-179		1	1	2	1	6	4	5	15	10						2	3	2	7	5
140-159	1			1	1	5	5	6	16	11	3	2	2	7	6	14	14	13	41	30
120-139							1		1	1	1	1	3	5	4	7	7	6	20	14
100-119			1	1	1	2			2	1	11	11	9	31	25	14	14	14	42	31
80- 99											5	4	4	13	10	2	1	1	4	3
60- 79											13	15	12	40	32	5	5	4	14	10
40- 59											9	8	7	24	19			1	1	1
20- 39											1	1	2	4	3					
Total	50	51	50	151	100	48	49	47	144	100	43	42	40	125	100	46	46	45	137	100

teaching of handwriting from 60 to 79 minutes, or about 15 minutes daily. It was also found that three per cent of the districts allocated as few as 20-39 minutes, and one per cent allocated as much as 180-199 minutes weekly, for the teaching of handwriting. Eighty-six per cent of the districts had allocations for the teaching of handwriting which ranged from 40 to 119 minutes weekly. This meant that the average daily class period, in eighty-six per cent of the responding districts, was slightly over 15 minutes in length for the teaching of handwriting.

An average of fourteen districts, or thirty-one per cent of the schools, gave 100-119 minutes of weekly instruction to spelling, or 20 minutes daily, as shown in Table XXII. The next most frequently used time allocation was 140-159 minutes weekly, reported by thirty per cent of the districts. A sixth grade received the largest allocation of 200-239 minutes per week. The least amount of time allocated to spelling was from 40-59 minutes weekly, occurring also in a sixth grade. Seventy-five per cent of the responding districts had allocations ranging from 100-119 minutes weekly. This meant that the most commonly utilized daily class period length for the teaching of spelling in the Texas Gulf Coast area was about 25 minutes.

Table XXIII gives the weekly minutes allocated to the language arts program of the districts surveyed. The areas of reading, English, handwriting, and spelling were combined in this table and are presented under the heading of "language arts." Twenty-four per cent of the districts indicated 600-639 minutes of weekly instruction, or about 124 minutes, were allotted daily to language arts. Twenty-one per cent of the districts had allocations of 640-679 minutes instruction for the language arts course offerings. Six per cent of the responding districts gave 440-479 minutes weekly to the teaching of the language arts, or about 90 minutes daily. Three per cent of the districts gave 840-879 minutes of weekly instruction, or 170 minutes daily, to the courses which comprised the language arts core. Seventy-eight per cent of the responding districts had time allocations for the teaching of the language arts which ranged from 560 to 759 minutes weekly. This meant that about 135 minutes of daily instruction in the language arts courses was the most commonly utilized allocation in the Texas Gulf Coast area.

TABLE XXIII

TIME ALLOCATIONS IN LANGUAGE ARTS IN SIXTY-FOUR GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Weekly Minutes	Four	Five	Six	Total	Mean	Per Cent
840-879	1	1	2	4	1.3	3
800-839	3	2	1	6	2.0	4
760-799	2	2	3	7	2.3	4
720-759	10	5	5	20	6.7	12
680-719	11	6	6	23	7.7	14
640-679	9	12	13	34	11.3	21
600-639	11	18	10	39	13.0	24
560-599	2	6	4	12	4.0	7
520-559	3	1	3	7	2.3	4
480-519			2	2	.7	1
440-479	2	2	5	9	3.0	6
Total	54	55	54	163	54.3	100

Weekly time allocations for physical education ranged from 140-159 minutes in fifty per cent of the responding districts of the Texas Gulf Coast area, which indicates that the average daily physical education period was 30 minutes long. There was no uniformity of practice concerning time allocations among the other 49 per cent of the districts as may be seen in Table XXIV.

Table XXIV reveals that twenty-two per cent of the districts had weekly time allocations of 140-159 minutes for the teaching of music, or 30 minutes daily. In nineteen per cent of the districts, however, the weekly allocations were only 80-99 minutes. In these districts the children usually attended music classes only twice a week for about 45 minutes each period.

Table XXIV reveals that twenty-eight per cent of the responding districts had 60-79 minutes weekly time allocations for the teaching of art. Nearly all of these districts utilized this time in one class period within the elementary school week. Twenty-two per cent of the districts had weekly allocations of 110-119 minutes in art which were generally divided into two periods of about 55 minutes each. Schools having as much as 140 minutes of instruction or more per week in art usually fused it with the language arts or social studies program and did not teach it daily, but only as the need for its inclusion occurred.

Much diversity of time allotment practices in health was found to be prevalent among the schools surveyed, as depicted by Table XXV. Twenty-six per cent of the districts allocated from 60-79 minutes weekly for instruction in health. Usually these allocations were utilized on one day of the school week for one lengthened period. Eighteen per cent of the districts responded that they had weekly allocations of from 100-119 minutes, these usually divided into two periods per week of about 55 minutes each. Very few of the districts taught health daily. In such isolated instances it was taught in either the fifth or sixth grades and usually for not more than one semester. Further study of Table XXV indicates that little emphasis is placed on formal instruction in health as evidenced by the time allotments which were provided for its teaching.

Time allocations for Spanish in the Texas Gulf Coast elementary schools are depicted by Table XXV.

TABLE XXIV

TIME ALLOCATIONS IN PHYSICAL EDUCATION, MUSIC, AND ART IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Time Allotment In Minutes Per Week	Physical Education					Music					Art				
	Grade			Total	Per cent	Grade			Total	Per cent	Grade			Total	Per cent
	4	5	6			4	5	6			4	5	6		
260-279	1	1	2	4	3		1	1	2	1					
240-259			1	1	1		1		1	1					
220-239		1	4	5	3		1	4	5	4		1		1	1
200-219	4	6	4	14	9	1	4	3	8	5	1	3	3	7	5
180-199							1	2	3	2					
160-179	2	4	5	11	8	1	1	5	7	5	2	2	2	6	4
140-159	26	24	24	74	51	8	12	12	32	22	4	4	4	12	9
120-139	7	7	5	19	13	3	1	1	5	3					
100-119	5	4	3	12	8	10	8	8	26	18	10	9	10	29	22
80- 99		1		1	1	11	9	8	28	19	5	6	7	18	13
60- 79	1			1	1	9	6	5	20	14	18	15	5	38	28
40- 59			1	1	1	2	3		5	4	8	7	7	22	16
20- 39			2	2	1	2		1	3	2	1		1	2	2
Total	46	48	51	145	100	47	48	50	145	100	49	47	39	135	100

Ninety per cent of the seven schools which offer Spanish in at least one grade of the intermediate unit had time allocations of 60-99 minutes weekly. In reality, some of them had two thirty-minute periods weekly, and some of them had two forty-five minute periods weekly. In the sixth grades of two systems, daily instruction was carried on in Spanish in class periods of 40 and 45 minutes. One may conclude that the elementary schools of the Texas Gulf Coast area were not placing a great deal of emphasis on the teaching of Spanish as it was found to be included in the curriculum of only seven schools.

Table XXV points out the practices concerning time spent on opening exercises as practiced by schools of the Texas Gulf Coast area. Forty-eight per cent of the responding districts set allotments of 40-59 minutes weekly for opening exercises. Upon analyzing these practices it was found that most of these districts utilized periods of 10 minutes daily for opening exercises; eighteen per cent of the districts gave less time to opening exercises, and thirty-four per cent gave more.

Table XXVI reveals that the most commonly utilized lunch period in the intermediate grades of the Texas Gulf Coast elementary schools was from 140-179 minutes weekly, or about 30 minutes daily. Forty-five per cent of the districts utilized this practice. Eleven per cent of the districts devoted less time daily for the lunch period. Only 3 per cent of the districts reporting had lunch periods in excess of 60 minutes daily.

Time allocation practices for recess may be seen in Table XXVI also. Twenty-eight per cent of the districts had 60-99 minute weekly allocations for recess; the most commonly utilized daily recess periods ranged from 15 to 25 minutes.

Summary

The chief organizational plan for instruction found among the districts surveyed was a self-contained classroom with special teachers for music, art, and physical education. The most prevalent policy regulating curricular

TABLE XXV

TIME ALLOCATIONS IN HEALTH, SPANISH, AND OPENING EXERCISES IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Time Allotment In Minutes Per Week	Health					Spanish					Opening Exercises				
	Grade					Grade					Grade				
	4	5	6	Total	Per cent	4	5	6	Total	Per cent	4	5	6	Total	Per cent
260-279			1	1	1										
240-259															
220-239		1	1	2	2			1	1	5					
200-219		1		1	1			1	1	5					
180-199															
160-179	1	2	2	5	4										
140-159	5	4	4	13	11								1	1	1
120-139	3	3	3	9	8										
100-119	8	6	7	21	18						4	3	2	9	6
80- 99	5	5	4	14	12	1	1	1	3	16		2	1	3	2
60- 79	11	10	9	30	26	6	5	3	14	74	15	12	9	36	25
40- 59	3	4	4	11	10						22	26	22	70	48
20- 39	4	2	2	8	7						8	7	10	25	17
0- 19													1	1	1
Total	40	38	37	115	100	7	6	6	19	100	49	50	46	145	100

TABLE XXVI

TIME ALLOCATIONS IN LUNCH AND RECESS IN SIXTY-FOUR TEXAS GULF COAST ELEMENTARY SCHOOL SYSTEMS (1962)

Time Allotment In Minutes Per Week	Lunch Grade 4	Lunch Grade 5	Lunch Grade 6	Lunch Total	Lunch Per cent	Recess Grade 4	Recess Grade 5	Recess Grade 6	Recess Total	Recess Per cent
420-459	1	1	1	3	2					
380-419										
340-379	1			1	1	1			1	1
300-339	3	4	3	10	6					
260-299	5	1		6	4					
220-259	7	8	7	22	14					
180-219	6	9	12	27	17	2	2	2	6	5
140-179	22	25	26	73	45	8	7	7	22	19
100-139	8	6	4	18	11	8	9	8	25	22
60- 99						11	11	10	32	28
20- 59						11	10	8	29	25
Total	53	54	53	160	100	41	39	35	115	100

time allotments was found to be prescribed time per subject with approximate limits. In actual practice about half of the districts adhered closely to time allotments as established by supervisory or administrative policy. The length of the school day was predominately seven hours; the length of the instructional year was 175 days. There was no apparent agreement on allocation of time for the various course offerings of the intermediate elementary curriculum.

ANALYSIS OF RELATIONSHIP BETWEEN CLASS PERIOD LENGTH AND PUPIL ACHIEVEMENT

Time allotments for the various course offerings of the elementary curriculum in the public schools of the Texas Gulf Coast vary considerably. In an effort to determine what relationships existed between varying class period lengths and pupil achievement in grades four, five, and six, a total of 973 sixth-grade pupils were tested during the month of April, 1962, for the purpose of securing data for comparative purposes. In order to insure the fact that time allotment variables do have a relationship to pupil achievement, the pupil data for children who had not been in attendance for all of grades four, five, and six were eliminated from consideration. There remained pupil data for 713 sixth-grade pupils available for analysis and comparison.

The Testing Plan

Since there is a high correlation between intelligence and academic achievement, it was necessary to administer a standardized mental maturity test to the maximum and minimum time allotment pupils of the investigation in order to equate their innate abilities. Once the mean intelligence quotients of the two groups of children had been ascertained, it was found that there was no significant statistical difference in their innate abilities. Therefore, in order to determine what relationship exists between time allocations and academic achievement, it was necessary to administer a standardized achievement test to establish the achievement level of the maximum and minimum time allotment pupils for comparative purposes.

The California Short Form Test of Mental Maturity and Form W of the California Achievement Tests Complete Battery were administered to the subjects of the investigation in April, 1962. The mental maturity test used covered four areas: spatial relationships, logical reasoning, numerical reasoning, and verbal concepts.

The achievement battery test which was administered included the subject matter areas of reading, arithmetic, and language. The reading test consisted of two divisions: reading vocabulary and reading comprehension. The reading vocabulary section was sub-divided into mathematics, science, social science, and general areas. The reading comprehension unit had the subheads: following directions, reference skills, and interpretations. The arithmetic test covered the areas of arithmetic reasoning and arithmetic fundamentals. The arithmetic reasoning division was divided into three areas: meaning, signs and symbols, and problems. The arithmetic fundamentals section was comprised of four areas: addition, subtraction, multiplication, and division. The language mechanics test covered capitalization, punctuation, and word usage.

In reporting the analysis of the achievement test results in relationship to varying class period lengths, each subject matter test area was reported individually in subsequent sections of this study. For the sake of clarity and simplicity in presentation, the mental maturity tests results were presented in composite form instead of by the individual test area.

Selection of Schools for Testing Purposes

For many reasons pupil data could not be gathered by the administration of standardized tests in all sixty-four schools. Foremost among these reasons was the fact that forty-three per cent of the districts had no uniformity of time allotment practices and consequently could not be used for testing purposes. Also, many of the remaining fifty-seven per cent of the districts had similar time allocations for the various subjects which ranged around the mean time allotment practices of the sixty-four districts responding. Therefore, only the districts who had uniform allocations which deviated greatly from the mean time allotment practices per subject could be used for gathering pupil data.

The survey of existing practices concerning time allocations in the Texas Gulf Coast area established the fact that thirteen of the sixty-four districts surveyed had prescribed time allotments per subject. Twenty-eight districts indicated that they were utilizing approximate time allocation per subject. By definition, approximate time allocations per subject were time intervals as established by supervisory or administrative policy with provision that the classroom teacher could deviate slightly from those intervals as justifiable need arose. These school systems also responded that they followed these two policies identically or adhered uniformly. As a result, this meant that the time allocations of these forty-one districts were stable enough to be used for obtaining pupil data for this study.

Since only the data for pupils who had been in attendance in the fourth, fifth, and sixth grades of a single school would be used in the study, it was necessary to test at least 120 sixth-grade children in the schools selected in order to have pupil data for approximately 100 students in each school for analysis purposes. It was found that only fourteen of the forty-one districts which had uniform time allotments had 120 sixth-grade pupils available for testing. The fourteen systems were then analyzed, as depicted by Table XXVII, to see if their average time allocations for grades four, five and six would meet stipulated maximum or minimum time allotments for reading, arithmetic, and language. The table also points out that only seven of the fourteen schools had either the stipulated maximum or minimum class period lengths of all three subjects area. Therefore, these seven schools were arbitrarily selected as the schools in which tests would be administered to provide pupil data for the study. The researcher then requested permission from the administrators of these seven schools for the privilege of gathering these pupil data and was granted permission to do so.

Table XXVIII sets forth the stipulated maximum and minimum class period lengths of the seven school systems in which pupil data were obtained and the average time spent in grades four, five, and six, by each of the school systems for reading, arithmetic, and language.

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TABLE XXVII

AVERAGE DAILY MAXIMUM AND MINIMUM CLASS PERIODS FOR GRADES FOUR, FIVE, AND SIX IN FOURTEEN TEXAS GULF COAST AREA PUBLIC SCHOOLS (1962)

	Reading		Arithmetic		Language	
School	Maximum 60-78 Minutes	Minimum 40-50 Minutes	Maximum 55-60 Minutes	Minimum 40-50 Minutes	Maximum 40-50 Minutes	Minimum 25-30 Minutes
A	X		X		X	
B	X		X			X
C	X		X			X
D		X		X		X
E		X		X	X	
F		X		X	X	
G		X		X	X	
H	X					X
I		X			X	
J			X		X	
K		X				X
L			X			
M	X				X	
N			X			

TABLE XXVIII

AVERAGE DAILY MAXIMUM AND MINIMUM CLASS PERIODS FOR GRADES FOUR, FIVE, AND SIX IN SEVEN SELECTED SCHOOL SYSTEMS, 1962

	Reading		Arithmetic		Language	
School	Maximum 60-78 Minutes	Minimum 40-50 Minutes	Maximum 55-60 Minutes	Minimum 35-45 Minutes	Maximum 40-50 Minutes	Minimum 25-30 Minutes
A	60		60		45	
B	78		60			27
C	60		55			30
D		50		45		30
E		40		40	40	
F		45		44	45	
G		50		35	40	

Class Period Lengths and Pupil Achievement in Sixth Grade in Reading, Arithmetic, and Language

It was found that pupils in Schools A, B, and C had maximum time allocations of 60-78 minutes of daily instruction for reading and 55-60 minutes daily for arithmetic as shown in Table XXVIII. Pupils in Schools D, E, F, and G had minimum time allocations of 40-50 minutes of daily instruction in reading and 35-45 minutes daily instruction in arithmetic. Table XXVII also depicts the fact that Schools A, E, F, and G had maximum time allocations of 40-50 minutes of daily instruction in language and that Schools B, C, and D had minimum daily allocations of 25-30 minutes for this subject.

In order to establish the relationship of varying class period lengths and pupil achievement in these three subject matter areas it was necessary to equate the intelligence quotients of the three groups of children. Table XXIX indicates the mean intelligence quotients of both the maximum and minimum time allotment pupils as they were grouped for study. The difference in the mean intelligence quotients for each group of pupils was subjected to the t-test for the purpose of determining whether or not there was any significant difference in the innate abilities of the maximum or minimum time allotment groups. Table XXIX gives the t-value which was derived from statistically treating these mean differences for each group of children. A t-value of 2.58 would have made the difference significant at the .01 level of confidence, or a value of 1.96 would have made them significant at the .05 level of confidence. For the difference to have been significant at the .10 level of confidence a t-value of 1.65 must be obtained. Table XXIX shows that the mean intelligence levels of the maximum and minimum time allotment pupils did not differ significantly. Therefore, since all of the groups of children had comparable innate abilities, the differences found in achievement would be attributable to time allotment variables.

TABLE XXIX

TOTAL INTELLIGENCE QUOTIENTS AND SIGNIFICANT STATISTICAL RELATIONSHIPS OF SIXTH GRADE PUPILS OF SELECTED TEXAS GULF COAST AREA SCHOOLS, 1962

				Reading and Arithmetic			
Type of Pupil	Schools	Number of Pupils	Mean I.Q. Maximum Time Pupils	Schools	Number of Pupils	Mean I.Q. Minimum Time Pupils	t-Value
All	A,B,C	329	103.65	D,E,F,G	384	103.25	.05*
I.Q. 95 or Less	A,B,C	92	86.29	D,E,F,G	99	85.87	.61*
I.Q. 115 or More	A,B,C	76	122.75	D,E,F,G	78	123.65	1.20*
				Language			
All	A,E,F	350	103.46	B,C,D	266	104.55	1.45*
I.Q. 95 or Less	A,E,F	91	86.32	B,C,D	60	86.64	.43*
I.Q. 115 or More	A,E,F,G	87	122.42	B,C,D	67	122.54	.18*

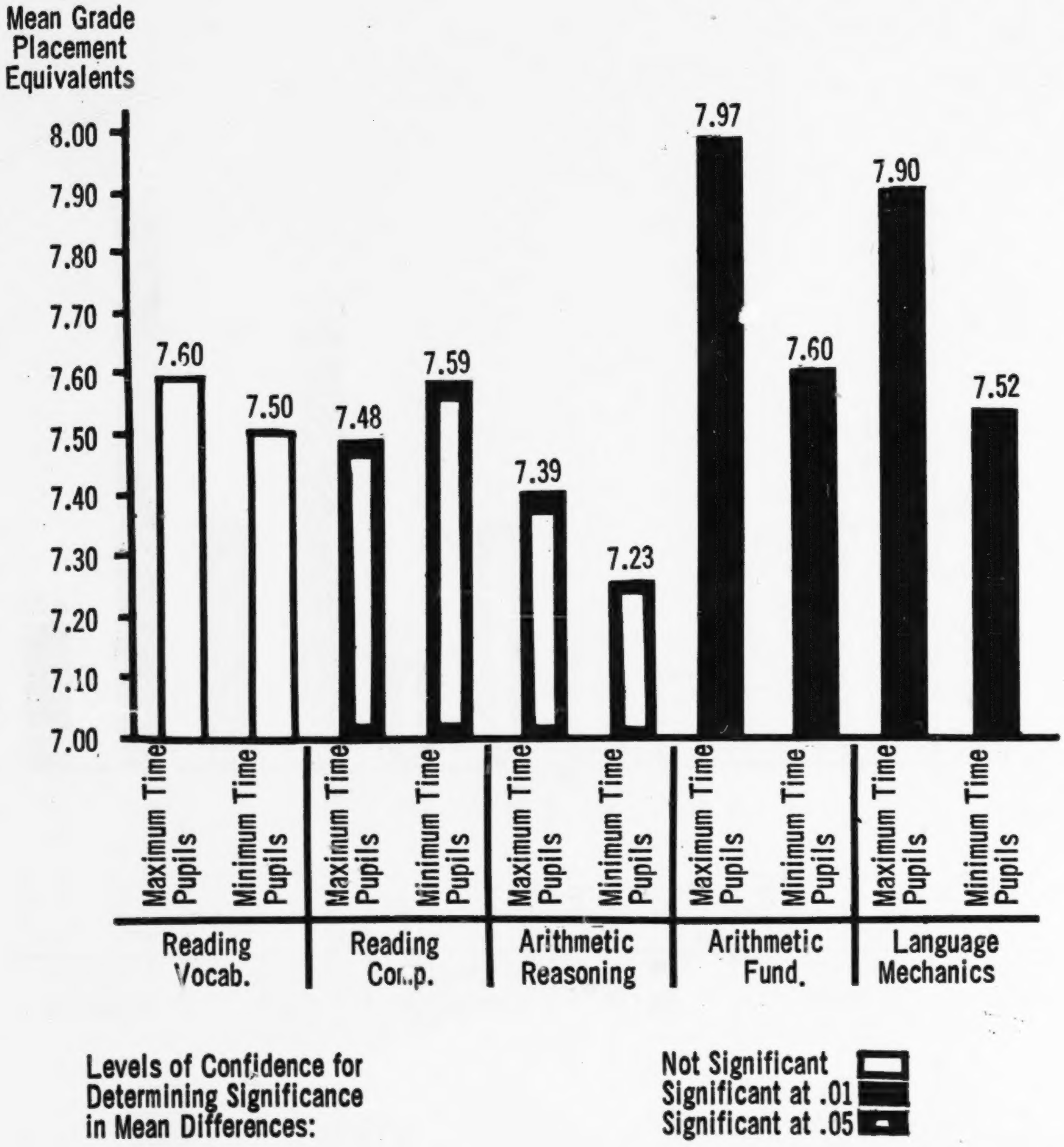
*Not Significant

Figure I depicts the relationship between time variable and pupil achievement for all of the students tested. Although maximum time allotments favored achievement in reading vocabulary by .10 of a grade the difference when subjected to the t-test was found to be insignificant. Minimum time allotments resulted in .11 of a grade more achievement in reading comprehension for all of the pupils tested, and the difference was significant at the .05 level of confidence. Maximum time allotment periods favored pupil achievement in arithmetic reasoning by .16 of a grade which was found to be significant at the .05 level of confidence. They also favored pupil achievement in arithmetic fundamentals by .37 of a grade and language mechanics by .38 of a grade, all being significant at the .01 level of confidence.

From a study of Figure I it may be concluded, therefore, that for the average student longer class periods resulted in significantly higher achievement in the areas of arithmetic and language. However, it may also be concluded that longer periods do not result in more significant pupil achievement in reading. Minimum time allotment pupils actually achieved significantly more than did maximum time allotment children.

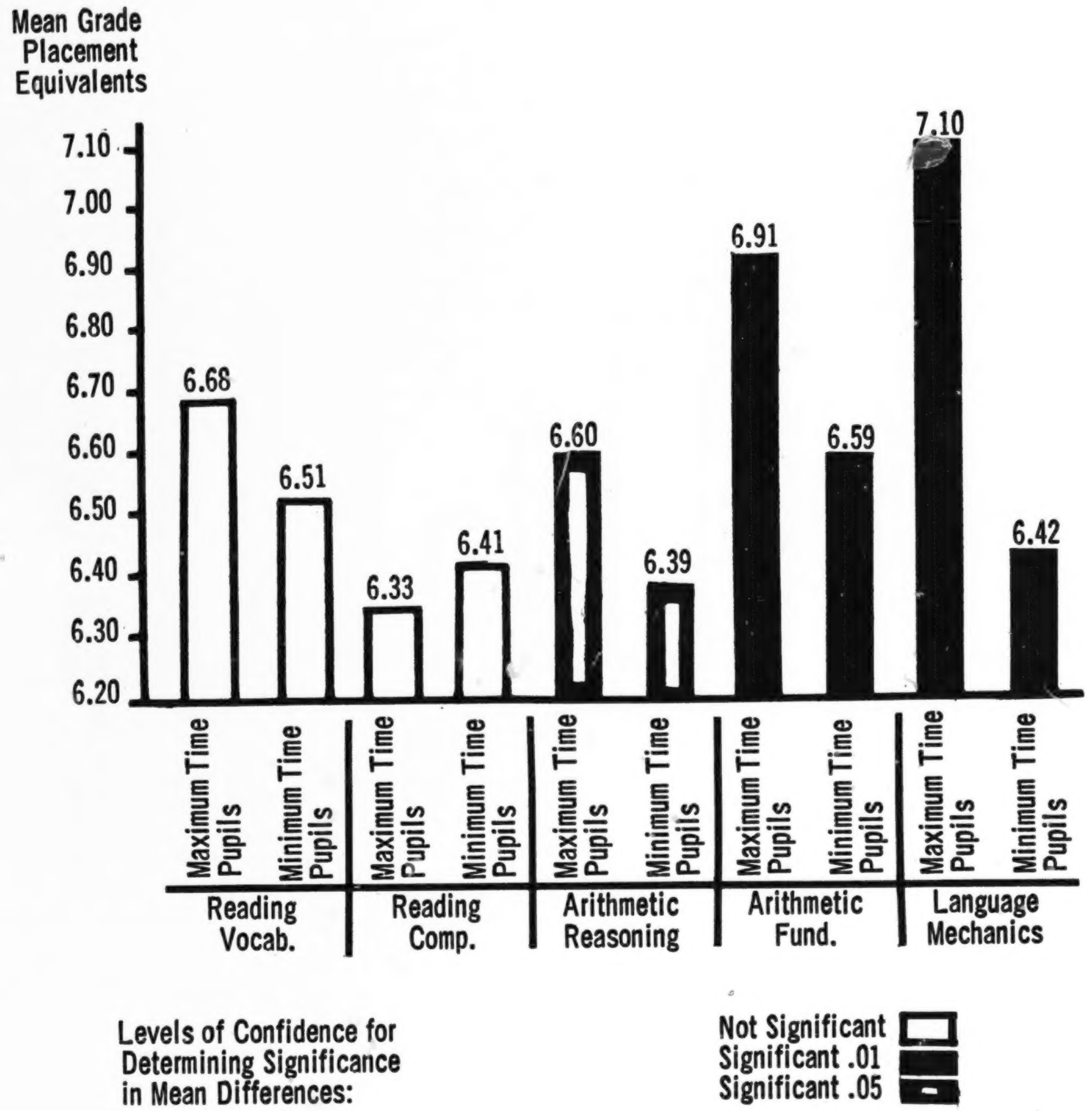
Class Period Lengths and Pupil Achievement Among Pupils with Intelligence Quotients of 95 or Less

In the areas tested in reading there was found to be no significant difference in pupil achievement resulting from time variables for children possessing intelligence quotients of 95 or less. Figure 2 does show, however, that longer class periods did result in greater pupil achievement for these children in arithmetic and language. In arithmetic reasoning the pupils achieved .21 of a grade more in maximum time allotment classes, and this improved achievement was significant at the .05 level of confidence. Also, these pupils of low intelligence achieved .32 of a grade more in arithmetic fundamentals and .68 of a grade more in language mechanics after having studied in the longer class periods. These two factors were significant at the .01 level of confidence.



RELATIONSHIPS BETWEEN TIME ALLOCATIONS AND PUPIL ACHIEVEMENT IN READING, ARITHMETIC, AND LANGUAGE FOR ALL MAXIMUM AND MINIMUM TIME ALLOTMENT PUPILS IN THE INTERMEDIATE GRADES OF THE TEXAS GULF COAST ELEMENTARY SCHOOLS

Figure 1



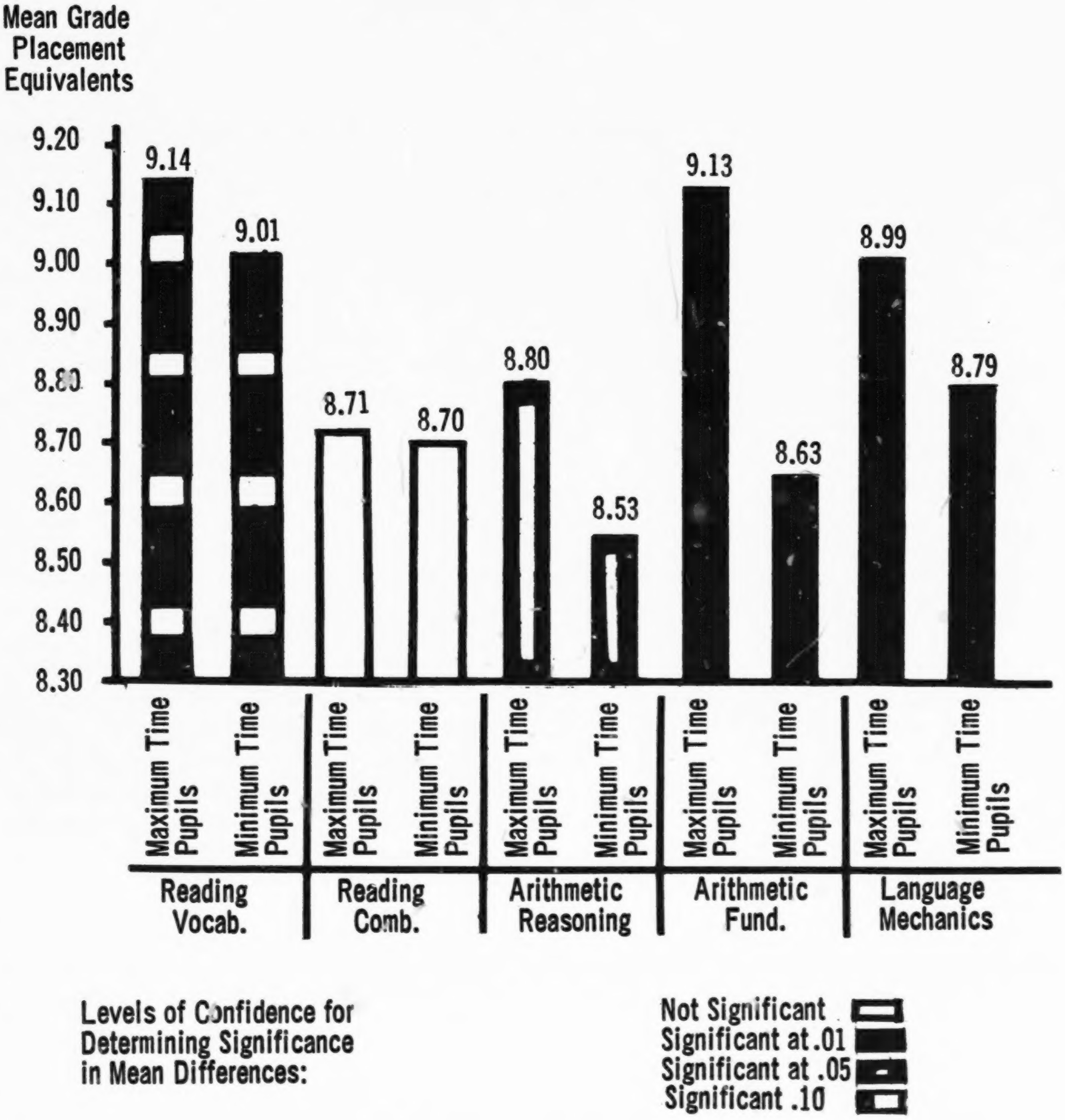
RELATIONSHIPS BETWEEN TIME ALLOCATIONS AND PUPIL ACHIEVEMENT IN READING, ARITHMETIC, AND LANGUAGE FOR MAXIMUM AND MINIMUM TIME ALLOTMENT PUPILS WITH INTELLIGENCE QUOTIENTS OF 95 OR LESS IN THE INTERMEDIATE GRADES OF THE TEXAS GULF COAST PUBLIC ELEMENTARY SCHOOLS

Figure 2

It may be concluded, therefore, that time variables as structured by this study for pupils of low intelligence do not have any significant relationship to pupil achievement in reading but that longer class period lengths resulted in significantly greater achievement in arithmetic and language for these students.

Class Period Lengths and Pupil Achievement Among Pupils with Intelligence Quotients of 115 or More

Figure 3 graphically depicts the fact that maximum class period lengths resulted in greater pupil achievement in every area tested for pupils with intelligence quotients of 115 or more. The greater achievement resulting from longer class periods was statistically significant in every area except in reading comprehension where a negative relationship results. The longer class periods resulted in .13 of a grade more achievement in reading vocabulary, and this difference was significant at the .10 level of confidence. Pupils studying in maximum time allotment schools achieved .27 of a grade more in arithmetic reasoning which was significant at the .05 level of confidence. Also, children in longer class periods achieved .50 of a grade in arithmetic fundamentals and .20 of a grade more in language mechanics; the difference in achievement being significant at the .01 level of confidence. Figure 3 shows that for students of high intelligence longer class periods resulted in significantly greater pupil achievement in every area except reading comprehension.



RELATIONSHIPS BETWEEN TIME ALLOCATIONS AND PUPIL ACHIEVEMENT IN READING, ARITHMETIC, AND LANGUAGE FOR MAXIMUM AND MINIMUM TIME ALLOTMENT PUPILS WITH INTELLIGENCE QUOTIENTS OF 115 OR MORE IN THE INTERMEDIATE GRADES OF THE TEXAS GULF COAST PUBLIC ELEMENTARY SCHOOLS

Figure 3

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Several conclusions were drawn from information assembled and analyzed in this study. The conclusion reached for each major objective investigated were:

REVIEW OF THE LITERATURE. A review of the literature pointed out four distinct facts concerning time allocations:

1. The time allotments of the elementary school curriculum have not been based upon scientific educational research.

2. The time allocations of the elementary school have resulted from societal pressures, administrative expediency, and opinions of leading educators.

3. The scientific educational research available regarding the relationship between time variables and pupil achievement was very meager.

4. Most of the scientific educational research which has been done showed that longer class period lengths resulted in greater pupil achievement in varying degrees.

ANALYSIS OF TIME ALLOTMENT POLICIES AND PRACTICES. An analysis of time allotment policies and practices in the Texas Gulf Coast elementary schools pointed out six important factors:

1. The most common plan of organization for instruction in the Texas Gulf Coast area was self-contained classrooms with special teachers for music, art, and physical education.

2. The most widely used policy regulating curricular time allotments was found to be prescribed time per subject with approximate limits.

3. About half of the districts, by actual practice, adhered very closely to time allotments as established by supervisory or administrative policy.

4. The school day was found to be predominately seven hours in length.

5. It was found that most of the districts had 175 days of annual instruction.

6. Time allocations for the fifteen subjects or special activities varied greatly among the sixty-four districts responding to the survey questionnaire.

RELATIONSHIPS BETWEEN TIME VARIABLES AND PUPIL ACHIEVEMENT IN READING, ARITHMETIC, AND LANGUAGE. An analysis of the relationships between time variables and pupil achievement in reading, arithmetic, and language as determined from scores derived from standardized tests, reveals significant associations. Upon contrasting the difference in means for the maximum and minimum time allotment pupils, the significant findings were:

1. Pupils achieved just as much in reading vocabulary and comprehension in daily periods of 40-50 minutes as did the children who were studying in 60-78 minutes periods, with one exception. The seventy-six pupils with intelligence quotients of 115 or more showed .13 of a grade more achievement in reading vocabulary at the sixth grade after having the longer periods of instruction for grades four, five, and six. This was significant at the .10 level of confidence. Therefore, it was concluded that children learn to read and are taught to read in the other subjects of the elementary curriculum as well, since the evidence of this investigation revealed that the minimum time allotment pupils achieved just as well as the maximum time allotment children in reading except for the one exception cited. Actually, in two instances minimum class periods favored pupil achievement in reading comprehension by .11 of a grade for average pupils and .08 of a grade for children with intelligence quotients of 95 or less.

2. The pupils showed greater achievement in arithmetic reasoning in 55-60 minute periods than did the children who were studying in the shorter 35-45 minute periods. When test results for all 713 of the

pupils tested were analyzed, it was found that longer periods resulted in .16 of a grade more achievement in the intermediate grades. Also, it was established that children with intelligence quotients of 95 or less showed .21 of a grade more achievement, and pupils with intelligence quotients of 115 or more showed .27 of a grade more achievement in arithmetic reasoning resulting from longer class period lengths. All of the factors were found to be significant at the .05 level of confidence.

3. In arithmetic fundamentals the pupils of the 55-60 minute daily periods achieved more than did the pupils who were studying in the 35-45 minute periods. When all of the children were considered, it was discovered that those in the longer periods achieved .37 of a grade more. Those of low intelligence achieved .32 of a grade more, and those of high intelligence showed .50 of a grade greater achievement than did similar pupils studying in shorter arithmetic periods. These achievement gains in arithmetic fundamentals resulting from longer class period lengths were statistically significant at the .01 level of confidence.

4. In language mechanics pupil achievement was facilitated by lengthened class periods. When the pupil data for children studying in class period lengths of 40-50 minute duration were compared with those studying in 25-30 minute class periods, a decided gain in achievement favored the pupils of longer time allocations. This factor, when tested statistically for significance, was found to be significant at the .01 level of confidence. The longer period achievement gains were as follows: for all pupils .38 of a grade, for those of low intelligence .68 of a grade, and for those of high intelligence .20 of a grade.

Recommendations

The following recommendations concerning varying time allotments and pupil achievement in the intermediate elementary grades of the Texas Gulf Coast are made:

1. That maximum class period lengths for formalized reading not be in excess of fifty minutes daily, as it was found that more time did not result in greater pupil achievement sufficient to warrant it.

2. That minimum daily arithmetic periods be set at not less than fifty-five minutes since it was found that substantially greater achievement was achieved by all pupils in longer periods.

3. That minimum daily class periods for language be set at not less than forty minutes because it was found that pupils involved in the longer classes achieved significantly more than did the children in shorter classes.

4. More research is needed to establish the relationship between time allotments and pupil achievement in the intermediate elementary grades. Specifically the areas wherein additional investigation needs to be done are: (1) in reading to determine if class lengths less than 40-50 minutes daily will result in as much pupil achievement; (2) in arithmetic to ascertain if class periods longer than 55-60 minutes daily will result in significantly greater pupil achievement, and (3) in language to determine if class periods which are longer than 40-50 minutes daily will effect substantially greater pupil achievement.

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